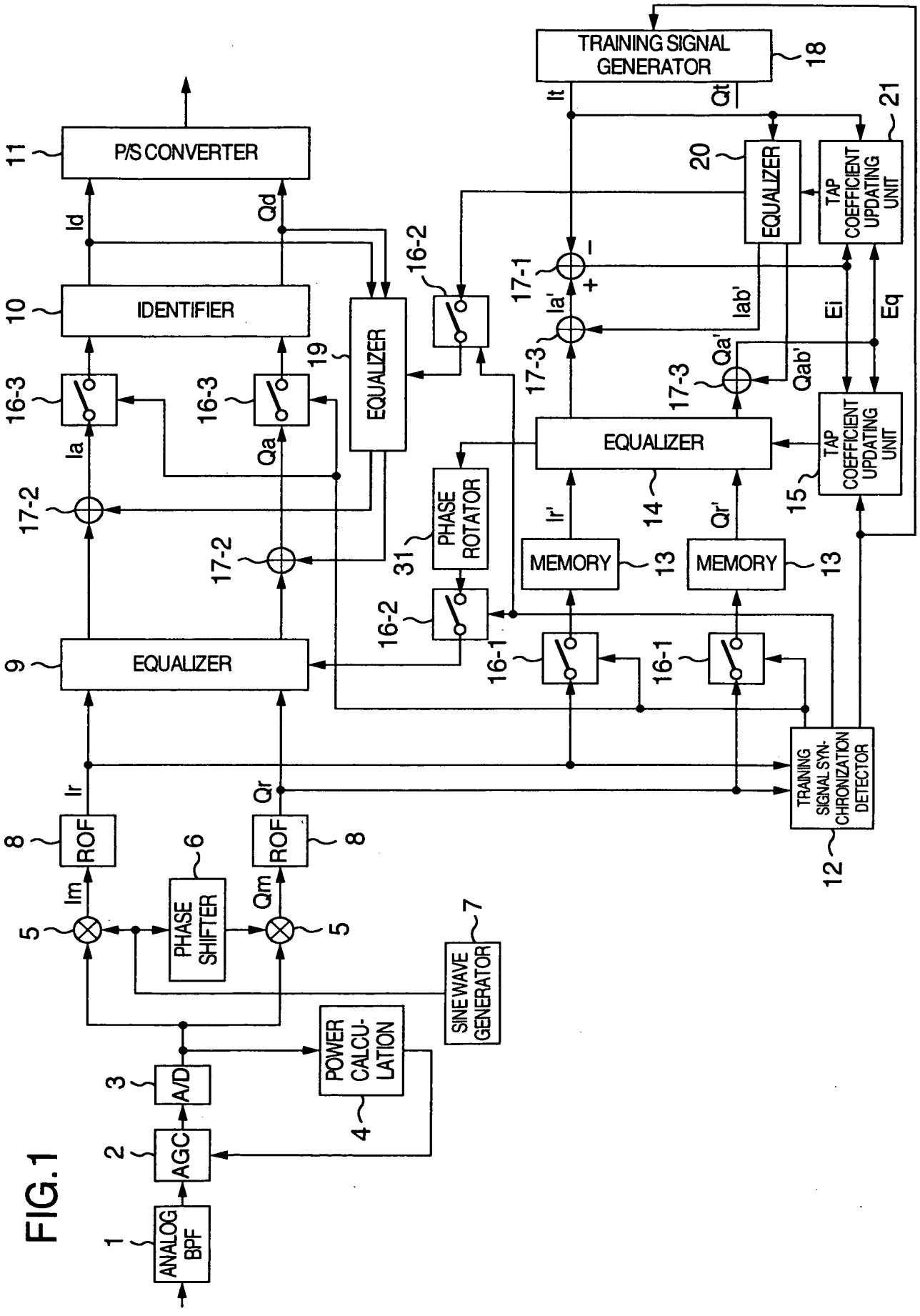

TRAINING SIGNAL GENERATOR
18
It
Qt
21
20
EQUALIZER
TAP COEFFICIENT UPDATING UNIT
11
P/S CONVERTER
Id
Qd
16-2
17-1
Ia'
Iab'
Ei
Eq
10
IDENTIFIER
19
EQUALIZER
16-3
16-3
17-3
Qa'
Qab'
Ia
Qa
EQUALIZER
TAP COEFFICIENT UPDATING UNIT
17-2
17-2
31
PHASE ROTATOR
Ir'
Qr'
14
15
MEMORY
13
MEMORY
13
16-2
9
EQUALIZER
16-1
16-1
Ir
Qr
TRAINING SIGNAL SYN-CHRONIZATION DETECTOR
12
8
ROF
8
ROF
Im
Qm
6
PHASE SHIFTER
5
5
7
SINEWAVE GENERATOR
POWER CALCU-LATION
4
3
A/D
2
AGC
1
ANALOG BPF

FIG.1

FIG.2

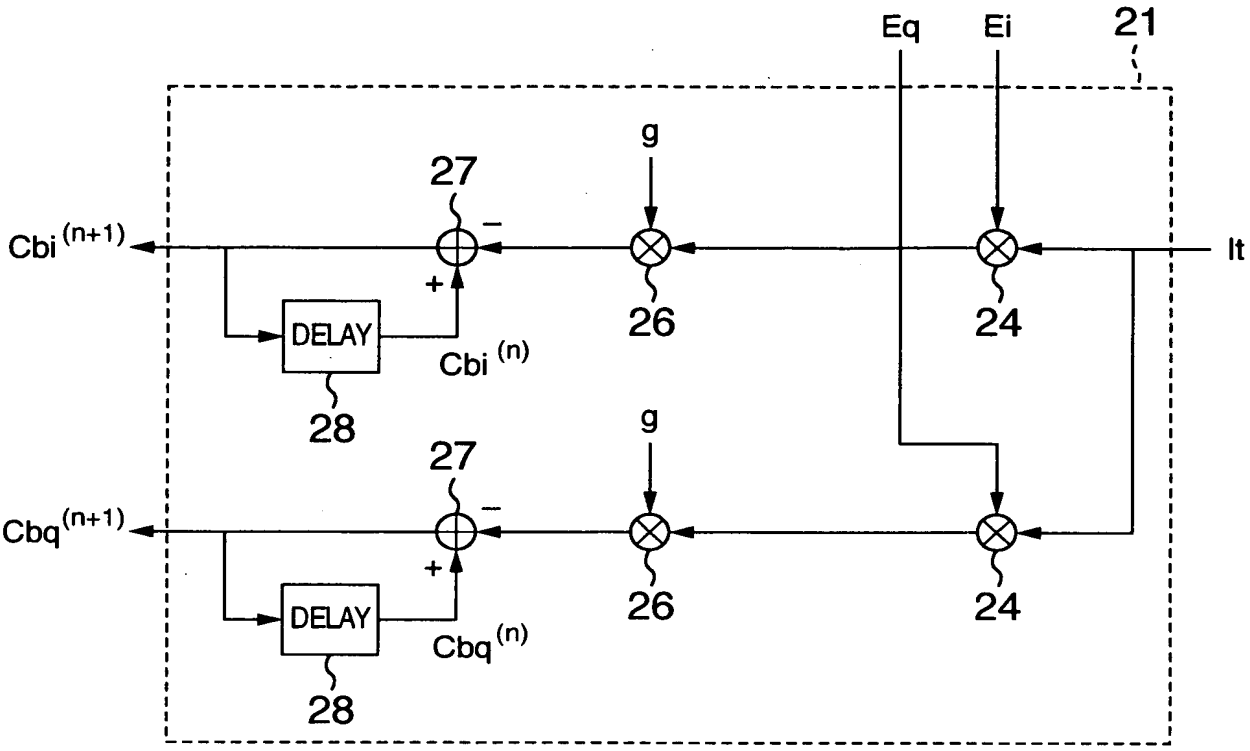

Eq
Ei
21
g
27
Cbi (n+1)
It
DELAY
Cbi (n)
26
24
28
g
27
Cbq (n+1)
DELAY
Cbq (n)
26
24
28

FIG.3

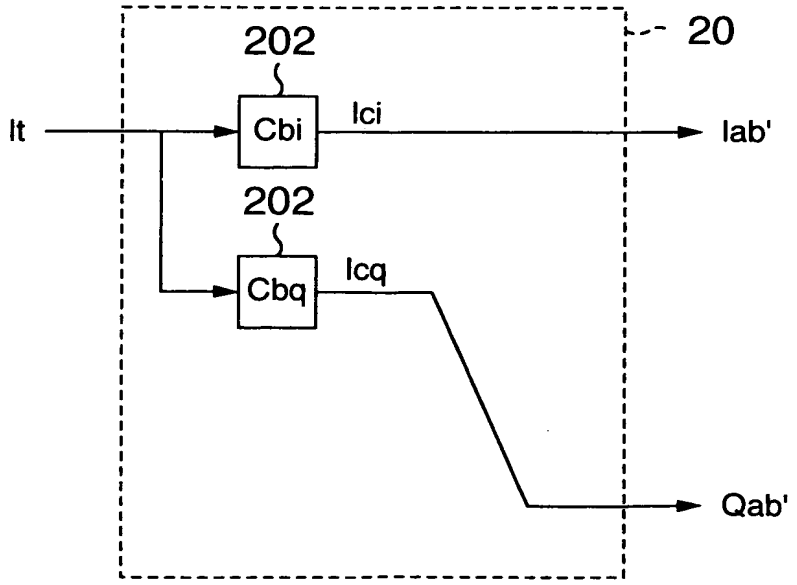

20
202
It
Cbi
Ici
Iab'
202
Cbq
Icq
Qab'

FIG.4

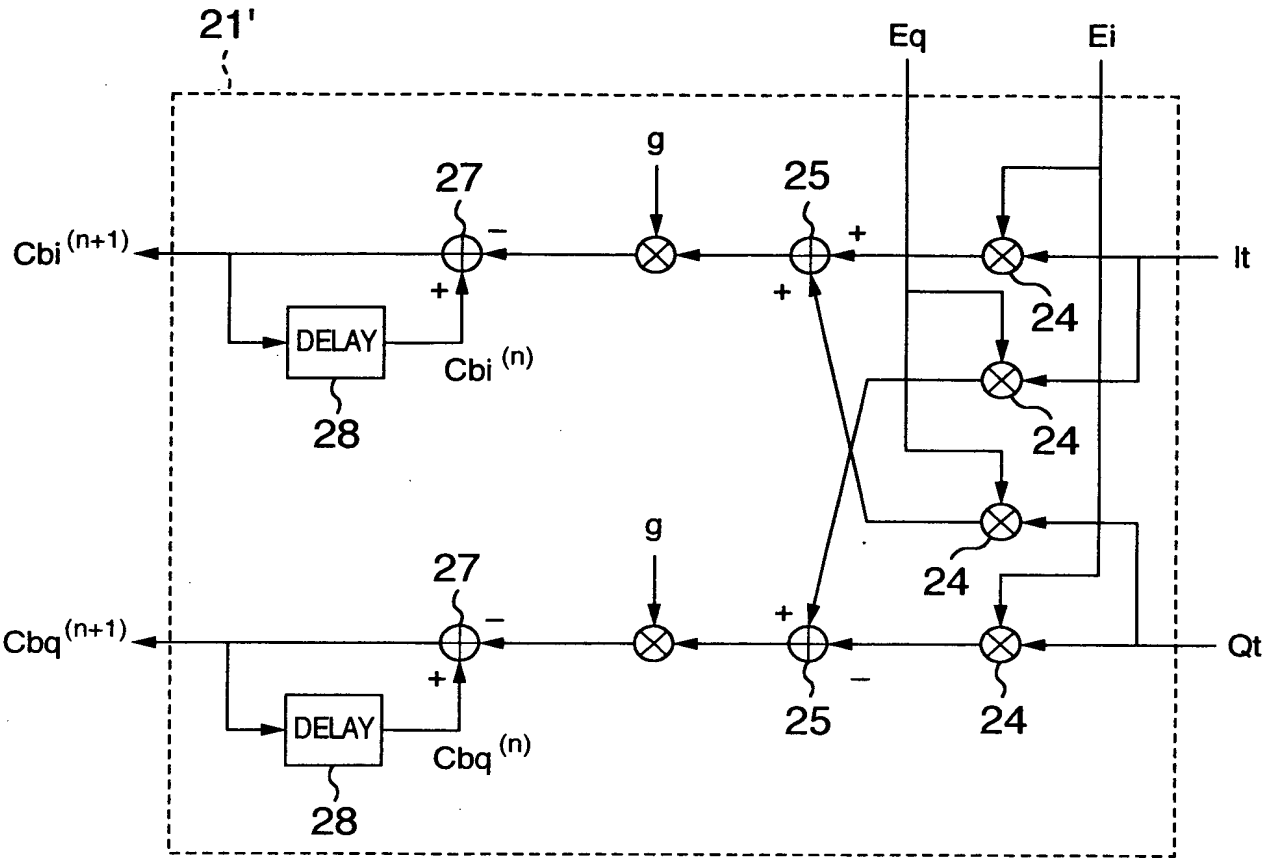

21'
Eq
Ei
g
27
25
Cbi (n+1)
It
DELAY
Cbi (n)
28
24
g
27
Cbq (n+1)
Qt
DELAY
Cbq (n)
28
25
24

FIG.5

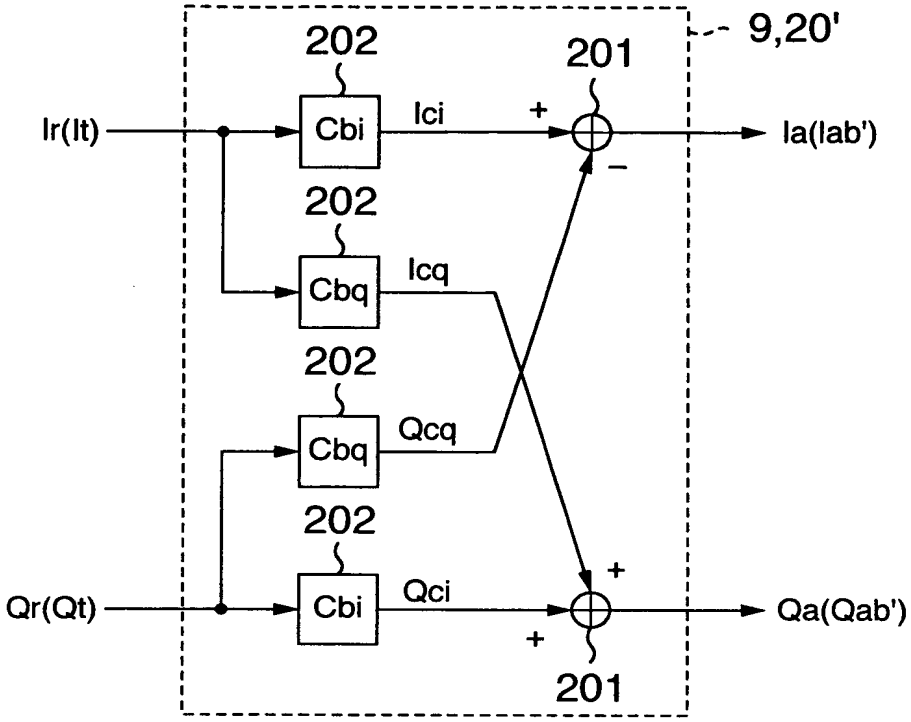

9,20'
202
201
Ir(It)
Cbi
Ici
+
Ia(Iab')
−
202
Cbq
Icq
202
Cbq
Qcq
202
Cbi
Qci
+
Qr(Qt)
+
Qa(Qab')
201

FIG.6

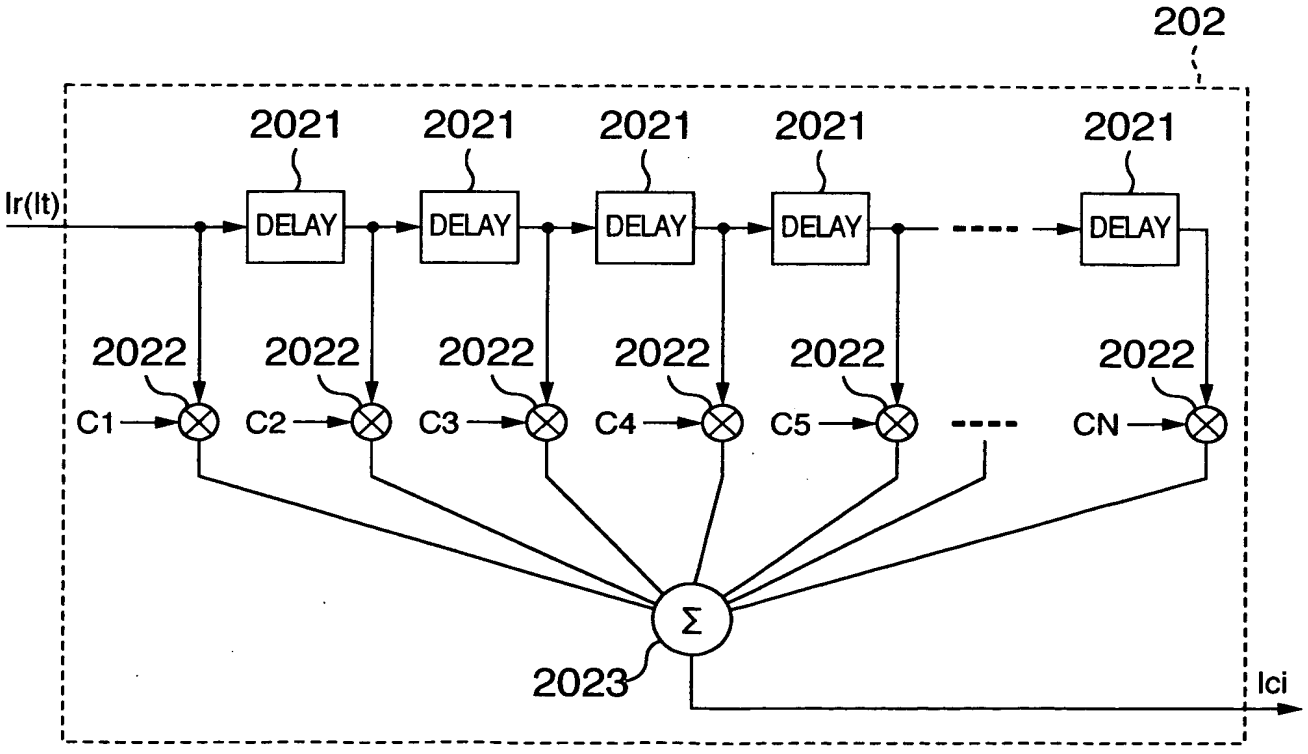

202
2021
2021
2021
2021
2021
Ir(It)
DELAY
DELAY
DELAY
DELAY
DELAY
2022
2022
2022
2022
2022
2022
C1
C2
C3
C4
C5
CN
Σ
2023
Ici

FIG.7

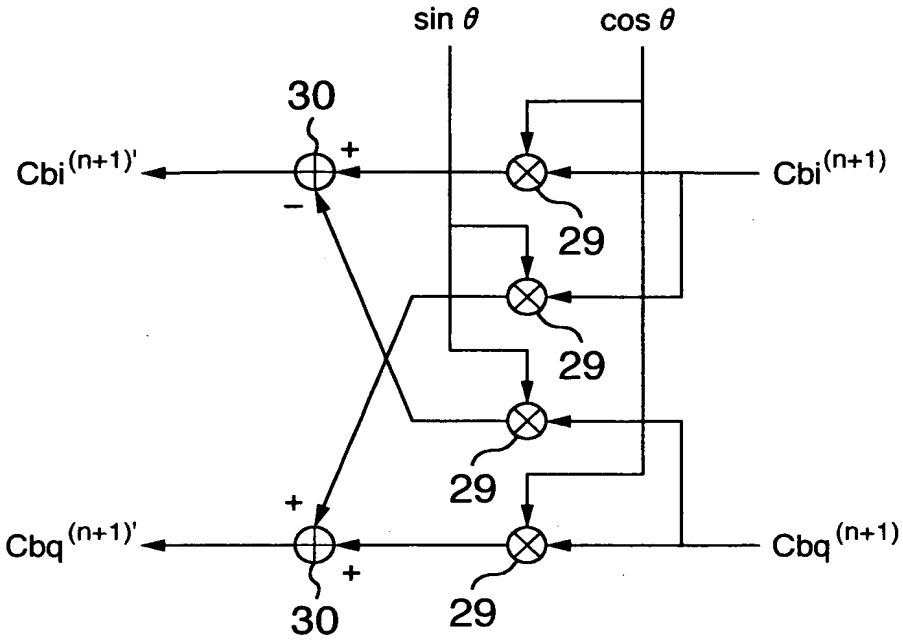
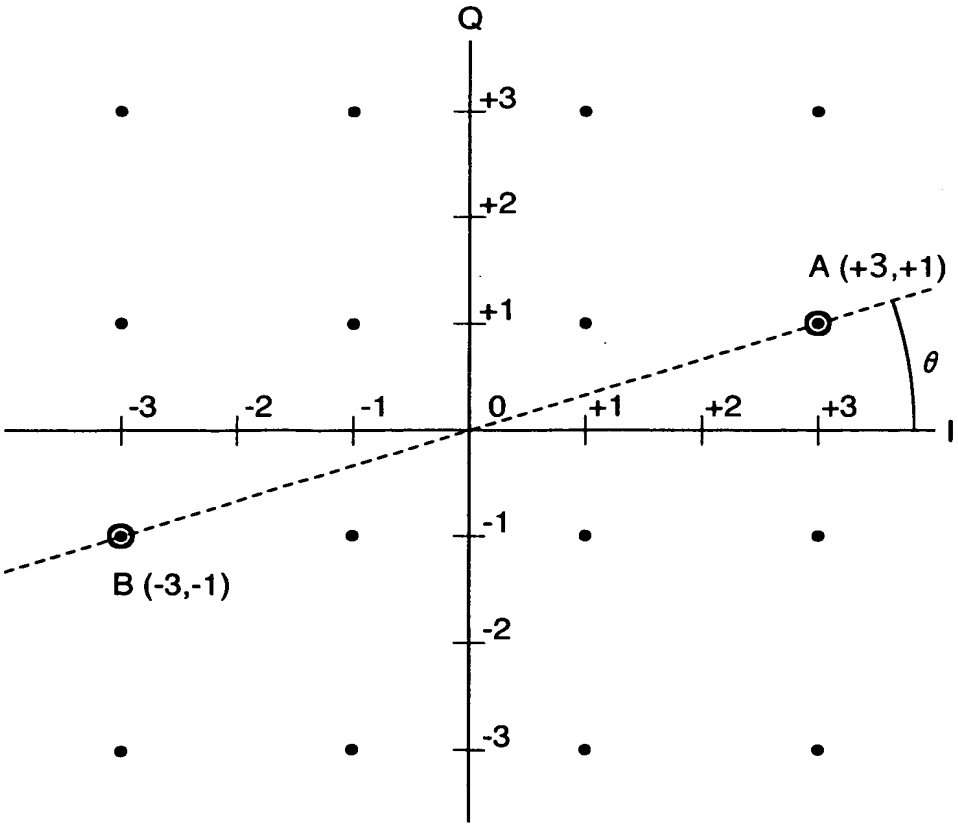
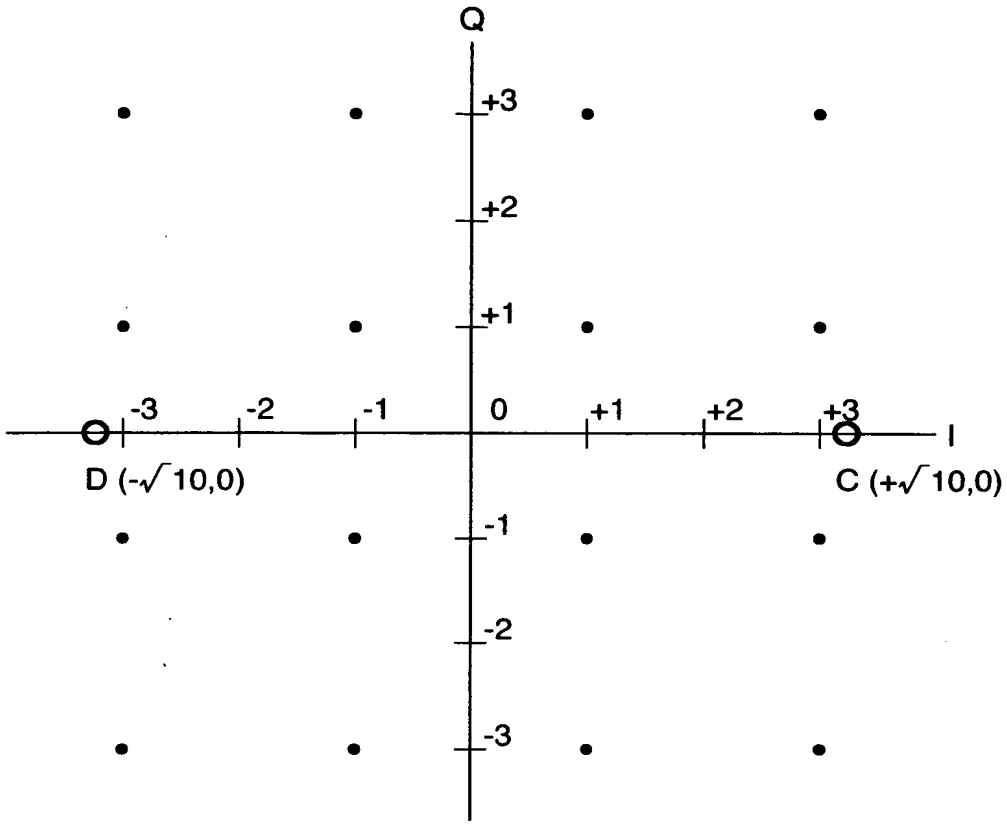


FIG.8



◎ SIGNAL POINT OF TRAINING SIGNAL

FIG.9



O SIGNAL POINT OF TRAINING SIGNAL

FIG.10

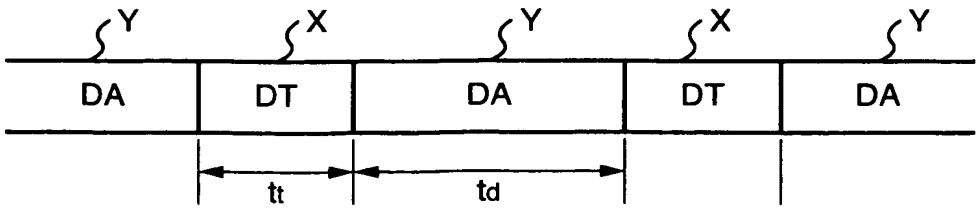


FIG.11
PRIOR ART

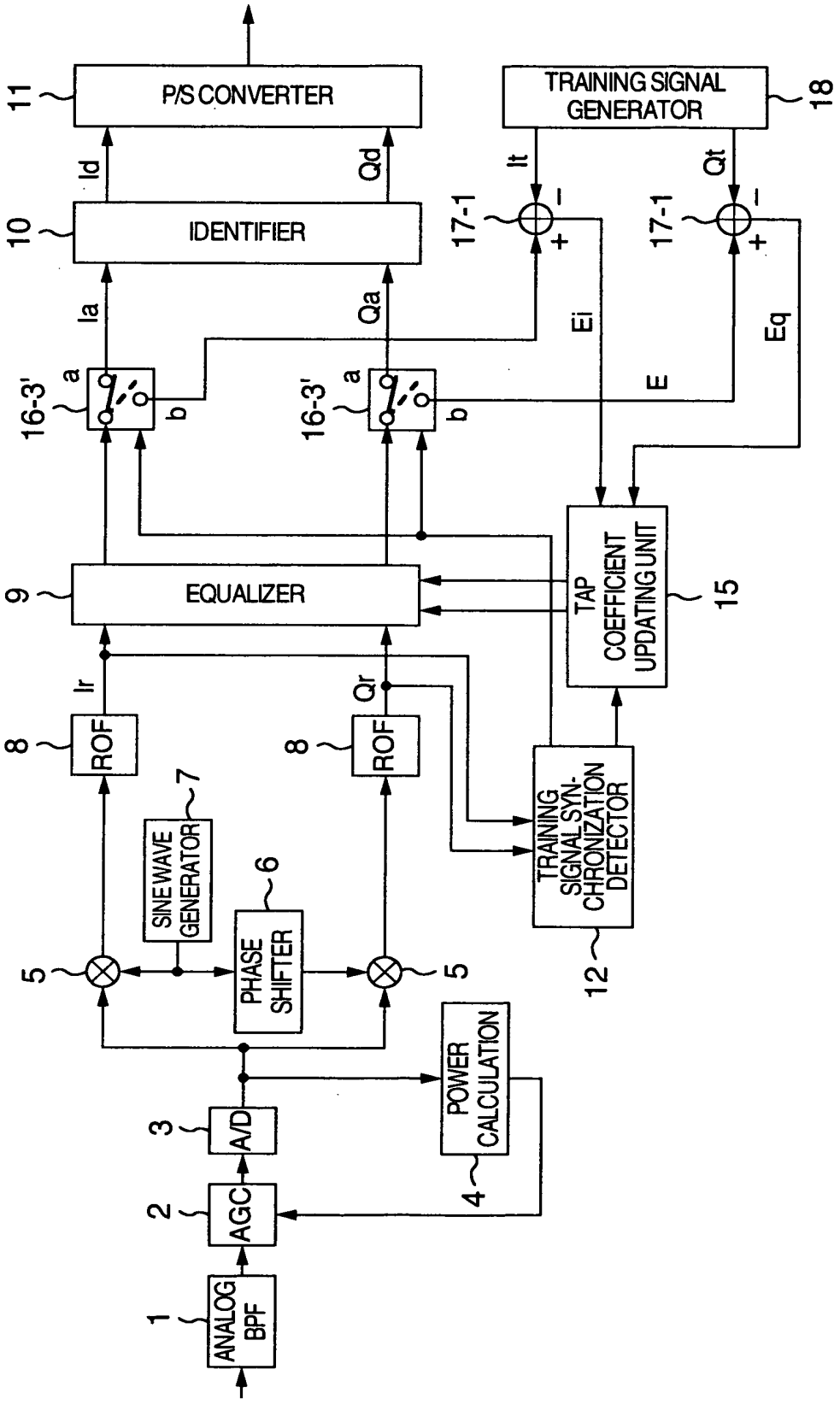


FIG.12

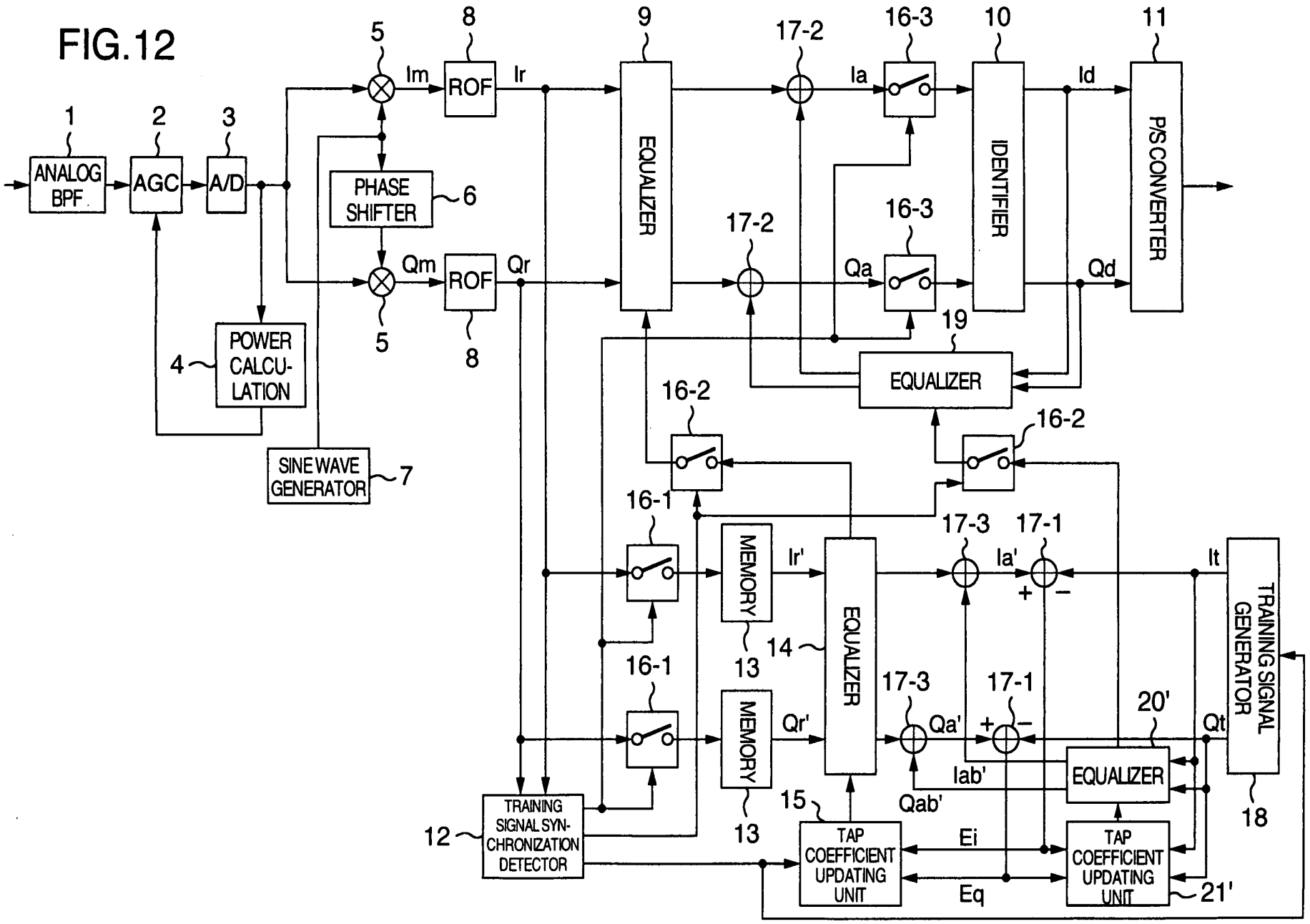
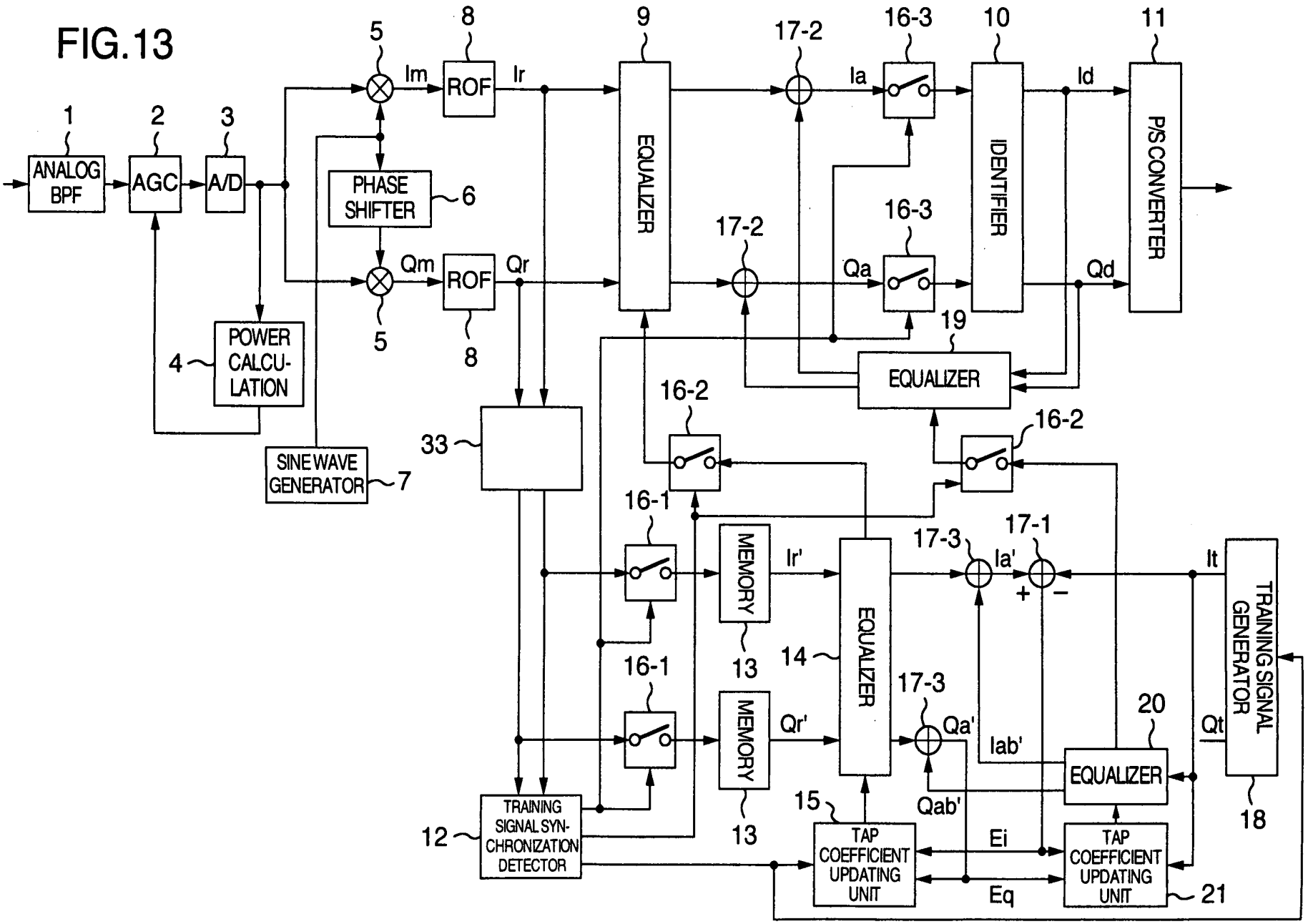

1
2
3
ANALOG BPF
AGC
A/D
4
POWER CALCU-LATION
5
Im
8
ROF
Ir
9
EQUALIZER
17-2
16-3
Ia
10
IDENTIFIER
Id
11
P/S CONVERTER
PHASE SHIFTER
6
Qm
ROF
Qr
5
8
17-2
16-3
Qa
Qd
19
EQUALIZER
16-2
16-2
SINE WAVE GENERATOR
7
16-1
MEMORY
Ir'
14
EQUALIZER
17-3
17-1
Ia'
It
+
−
TRAINING SIGNAL GENERATOR
18
16-1
MEMORY
13
Qr'
17-3
17-1
Qa'
20'
Qt
+
−
Iab'
EQUALIZER
Qab'
15
12
TRAINING SIGNAL SYN-CHRONIZATION DETECTOR
13
TAP COEFFICIENT UPDATING UNIT
Ei
Eq
TAP COEFFICIENT UPDATING UNIT
21'

FIG.13


1
2
3
ANALOG BPF
AGC
A/D
4
POWER CALCU-LATION
5
Im
ROF
8
Ir
PHASE SHIFTER
6
Qm
ROF
Qr
5
8
SINE WAVE GENERATOR
7
9
EQUALIZER
17-2
16-3
Ia
10
IDENTIFIER
Id
11
P/S CONVERTER
17-2
16-3
Qa
Qd
19
EQUALIZER
33
16-2
16-2
16-1
MEMORY
Ir'
13
14
EQUALIZER
17-3
Ia'
17-1
+
−
It
TRAINING SIGNAL GENERATOR
18
16-1
MEMORY
Qr'
13
17-3
Qa'
Iab'
20
EQUALIZER
Qt
12
TRAINING SIGNAL SYN-CHRONIZATION DETECTOR
15
TAP COEFFICIENT UPDATING UNIT
Ei
Eq
Qab'
TAP COEFFICIENT UPDATING UNIT
21

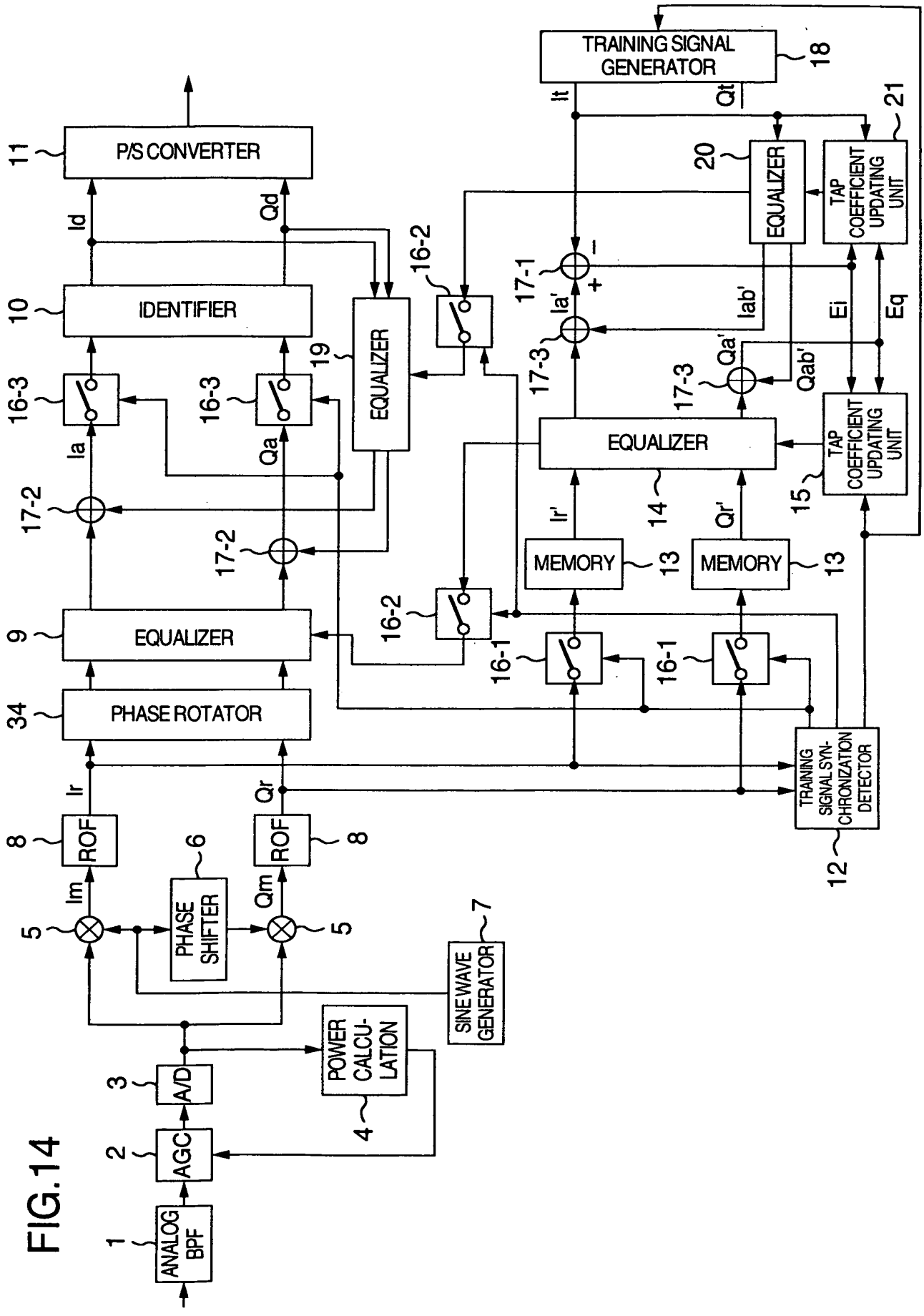

TRAINING SIGNAL GENERATOR
18
It
Qt
21
20
EQUALIZER
TAP COEFFICIENT UPDATING UNIT
11
P/S CONVERTER
Id
Qd
16-2
17-1
Ia'
Iab'
Ei
Eq
10
IDENTIFIER
19
EQUALIZER
16-3
16-3
17-3
Qa'
Qab'
17-3
Ia
Qa
EQUALIZER
TAP COEFFICIENT UPDATING UNIT
17-2
17-2
14
15
Ir'
Qr'
MEMORY
13
MEMORY
13
16-2
9
EQUALIZER
16-1
16-1
34
PHASE ROTATOR
TRAINING SIGNAL SYN-CHRONIZATION DETECTOR
12
Ir
Qr
8
ROF
ROF
8
6
Im
Qm
PHASE SHIFTER
5
5
7
SINE WAVE GENERATOR
POWER CALCU-LATION
4
3
A/D
2
AGC
1
ANALOG BPF

FIG.14

FIG.15

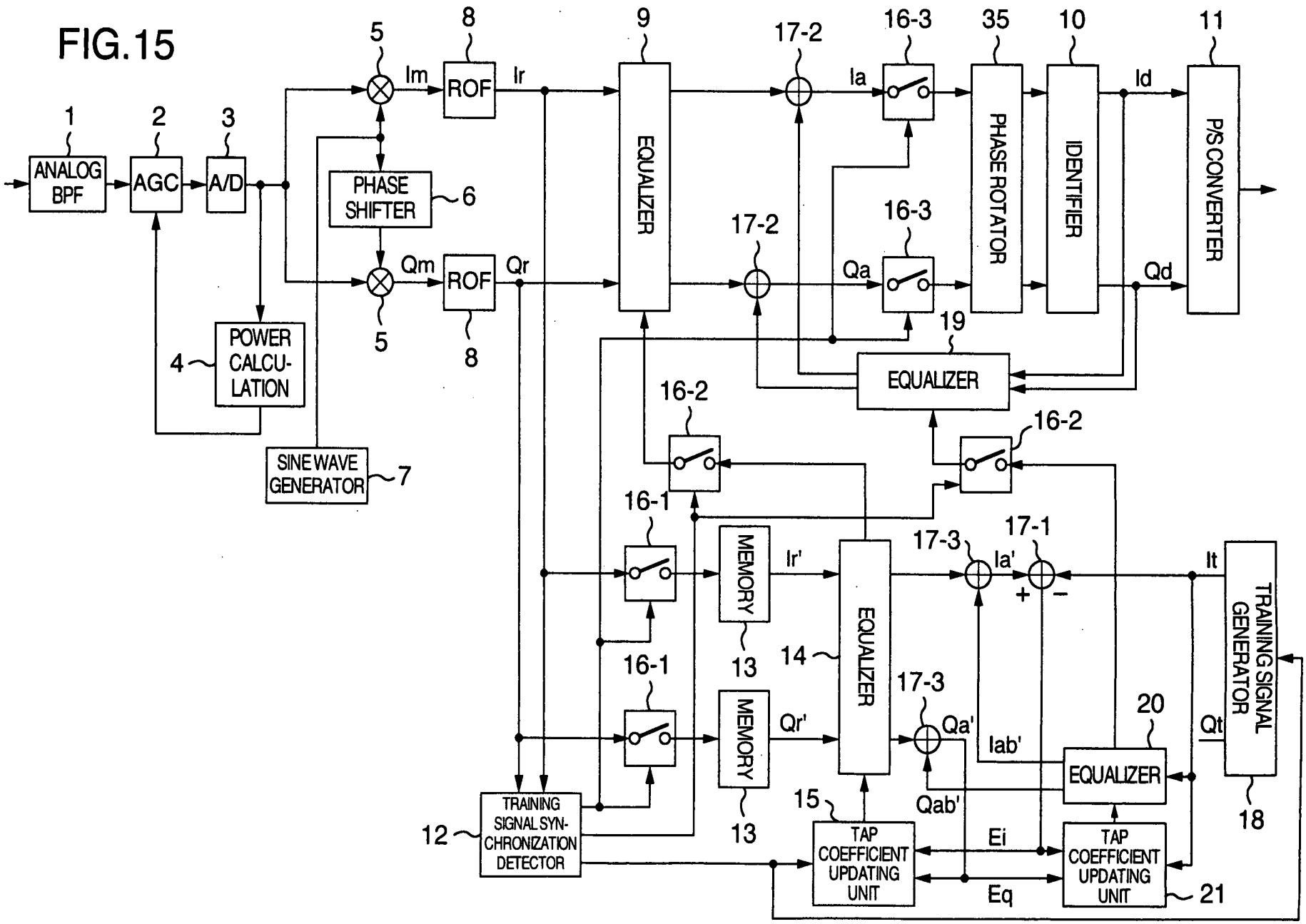

1
ANALOG BPF
2
AGC
3
A/D
4
POWER CALCU-LATION
5
Im
5
Qm
6
PHASE SHIFTER
7
SINE WAVE GENERATOR
8
ROF
8
ROF
Ir
Qr
9
EQUALIZER
17-2
17-2
16-3
Ia
16-3
Qa
35
PHASE ROTATOR
10
IDENTIFIER
11
P/S CONVERTER
Id
Qd
19
EQUALIZER
16-2
16-2
16-1
16-1
MEMORY
13
MEMORY
13
Ir'
Qr'
14
EQUALIZER
17-3
Ia'
17-1
+
−
17-3
Qa'
Iab'
Qab'
20
EQUALIZER
It
Qt
TRAINING SIGNAL GENERATOR
18
12
TRAINING SIGNAL SYN-CHRONIZATION DETECTOR
15
TAP COEFFICIENT UPDATING UNIT
Ei
Eq
TAP COEFFICIENT UPDATING UNIT
21

FIG.16

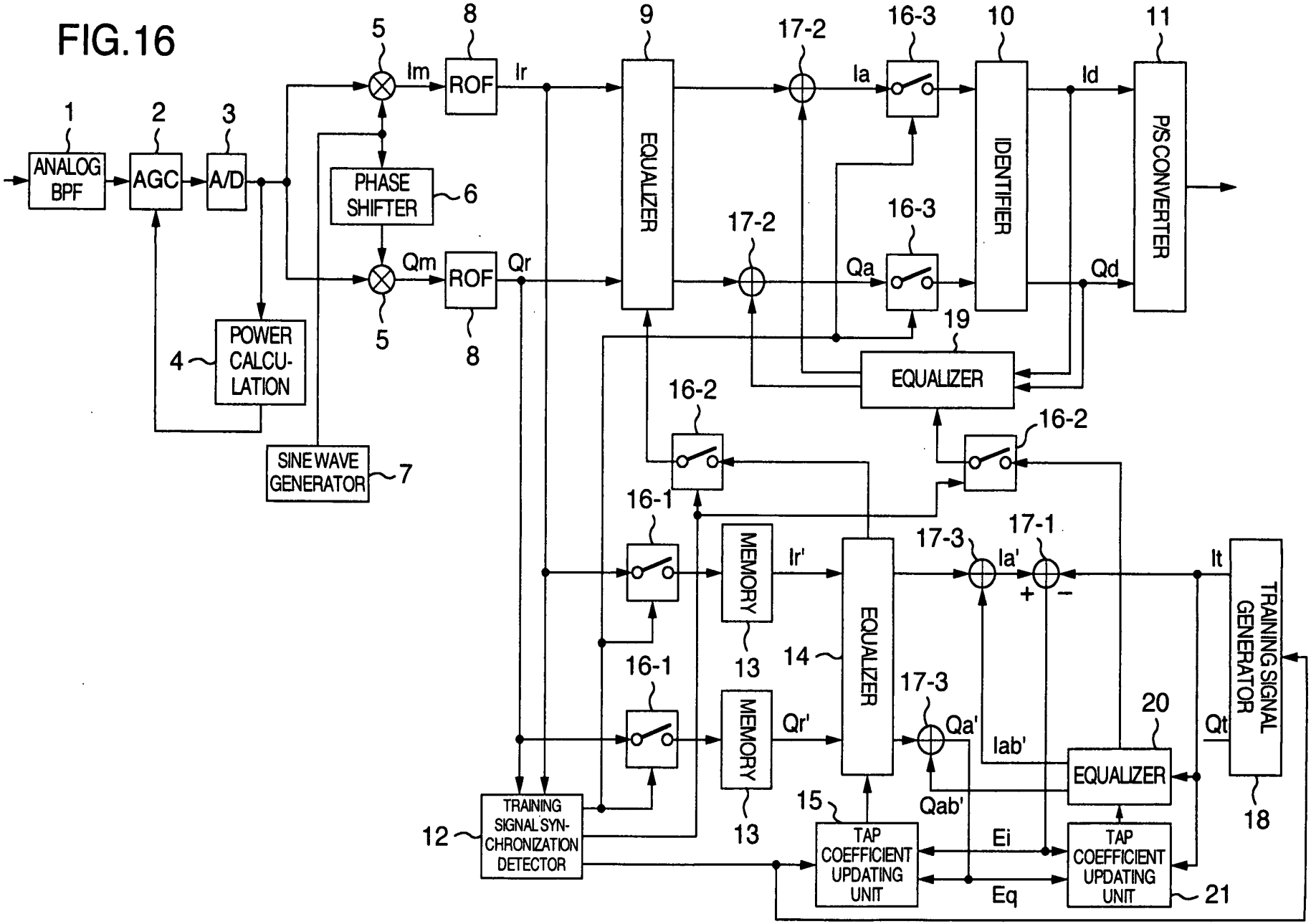
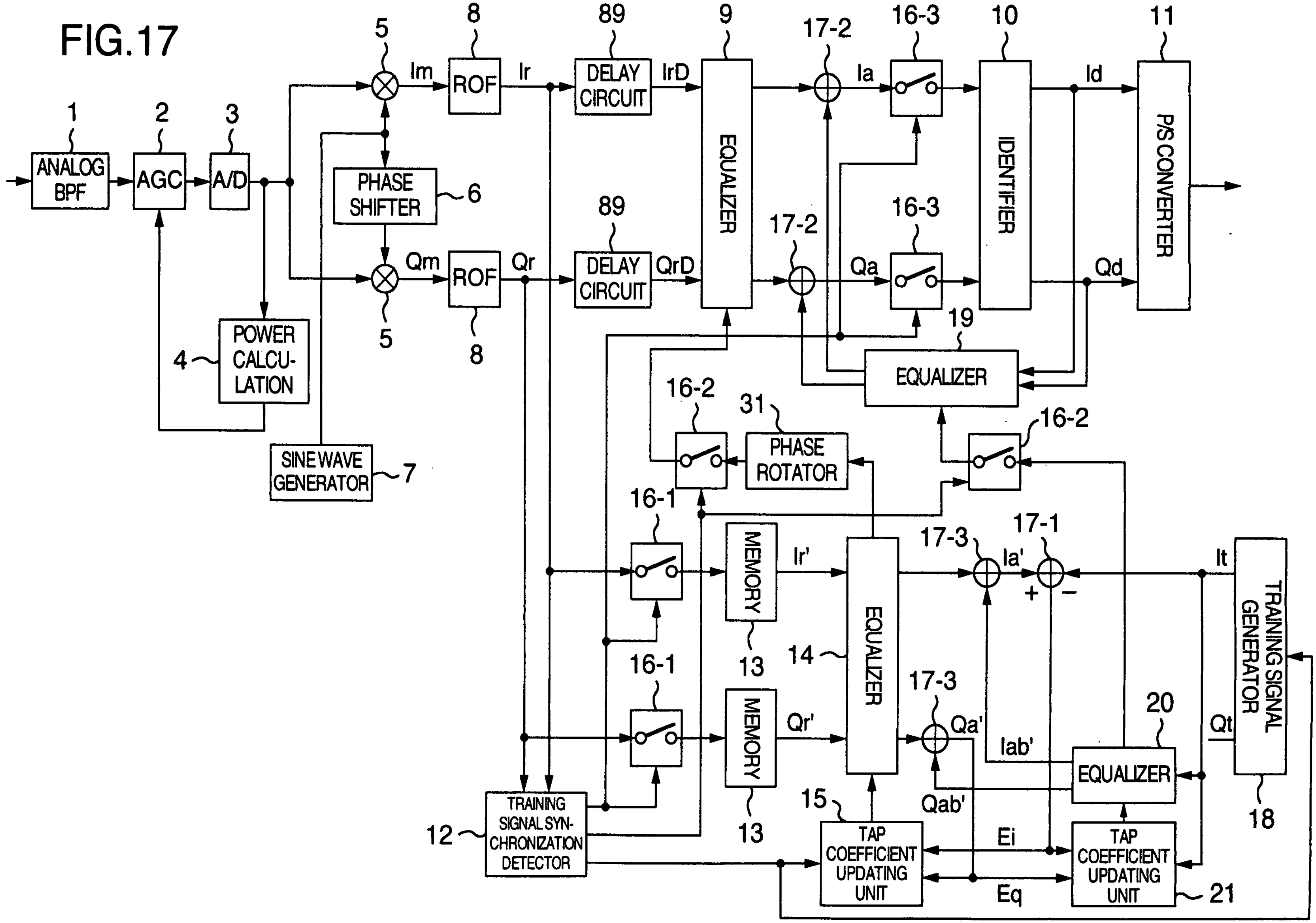
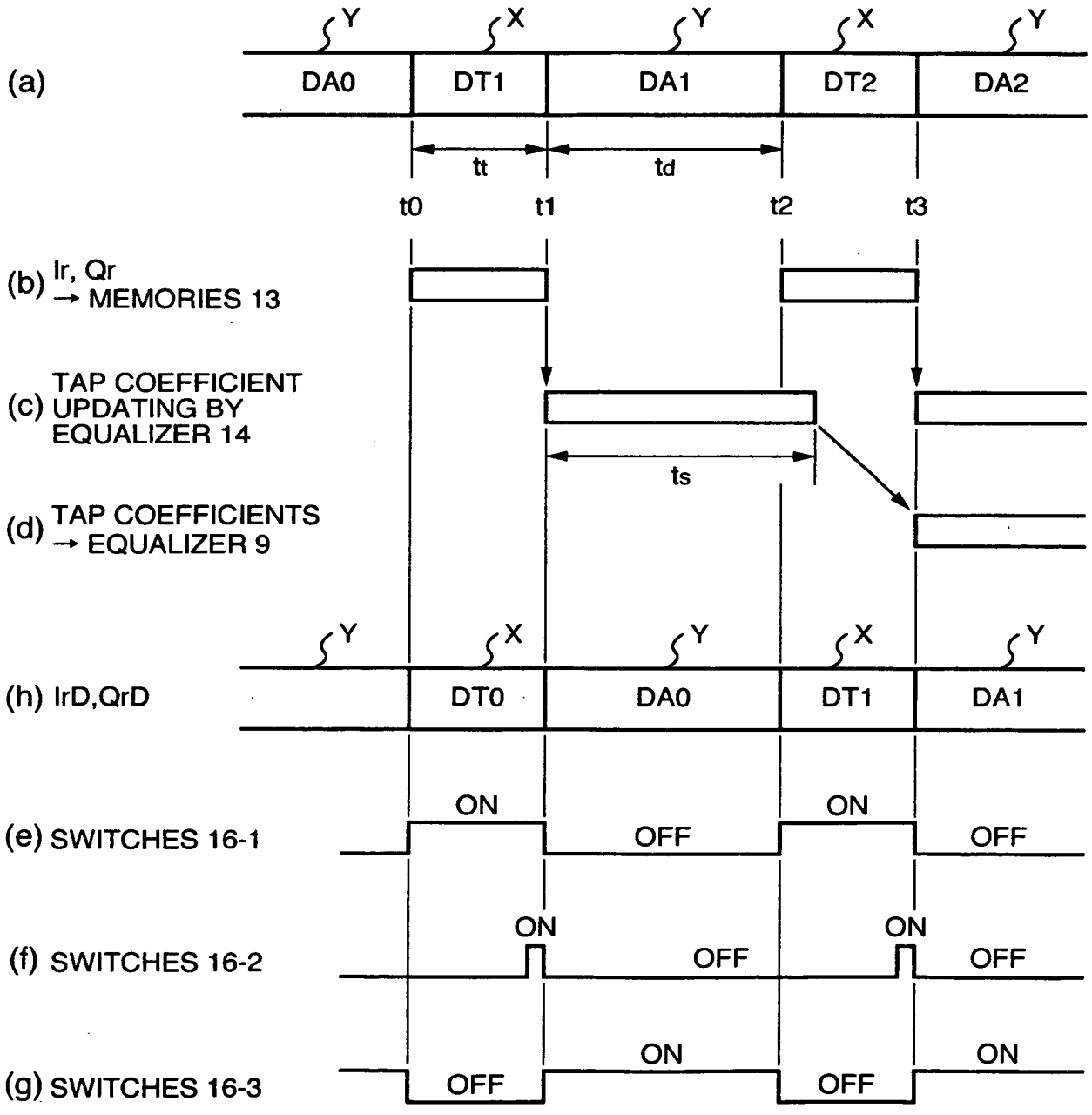

1
2
3
ANALOG BPF
AGC
A/D
4
POWER CALCU-LATION
SINE WAVE GENERATOR
7
5
Im
8
ROF
Ir
PHASE SHIFTER
6
Qm
ROF
Qr
5
8
9
EQUALIZER
17-2
16-3
Ia
10
IDENTIFIER
Id
11
P/S CONVERTER
17-2
16-3
Qa
Qd
19
EQUALIZER
16-2
16-2
16-1
16-1
MEMORY
Ir'
13
14
EQUALIZER
17-3
Ia'
17-1
+
−
It
TRAINING SIGNAL GENERATOR
18
17-3
Qa'
Iab'
20
Qt
EQUALIZER
MEMORY
Qr'
13
15
Qab'
12
TRAINING SIGNAL SYN-CHRONIZATION DETECTOR
TAP COEFFICIENT UPDATING UNIT
Ei
Eq
TAP COEFFICIENT UPDATING UNIT
21

FIG.17



ANALOG BPF
AGC
A/D
POWER CALCU-LATION
SINE WAVE GENERATOR
PHASE SHIFTER
ROF
DELAY CIRCUIT
EQUALIZER
IDENTIFIER
P/S CONVERTER
PHASE ROTATOR
MEMORY
TRAINING SIGNAL SYN-CHRONIZATION DETECTOR
TAP COEFFICIENT UPDATING UNIT
TRAINING SIGNAL GENERATOR
Im
Qm
Ir
Qr
IrD
QrD
Ia
Qa
Id
Qd
Ir'
Qr'
Ia'
Qa'
Iab'
Qab'
It
Qt
Ei
Eq

FIG.18


(a)
Y
X
Y
X
Y
DA0
DT1
DA1
DT2
DA2
tt
td
t0
t1
t2
t3
(b) Ir, Qr → MEMORIES 13
(c) TAP COEFFICIENT UPDATING BY EQUALIZER 14
ts
(d) TAP COEFFICIENTS → EQUALIZER 9
(h) IrD,QrD
DT0
DA0
DT1
DA1
(e) SWITCHES 16-1
ON
OFF
(f) SWITCHES 16-2
(g) SWITCHES 16-3

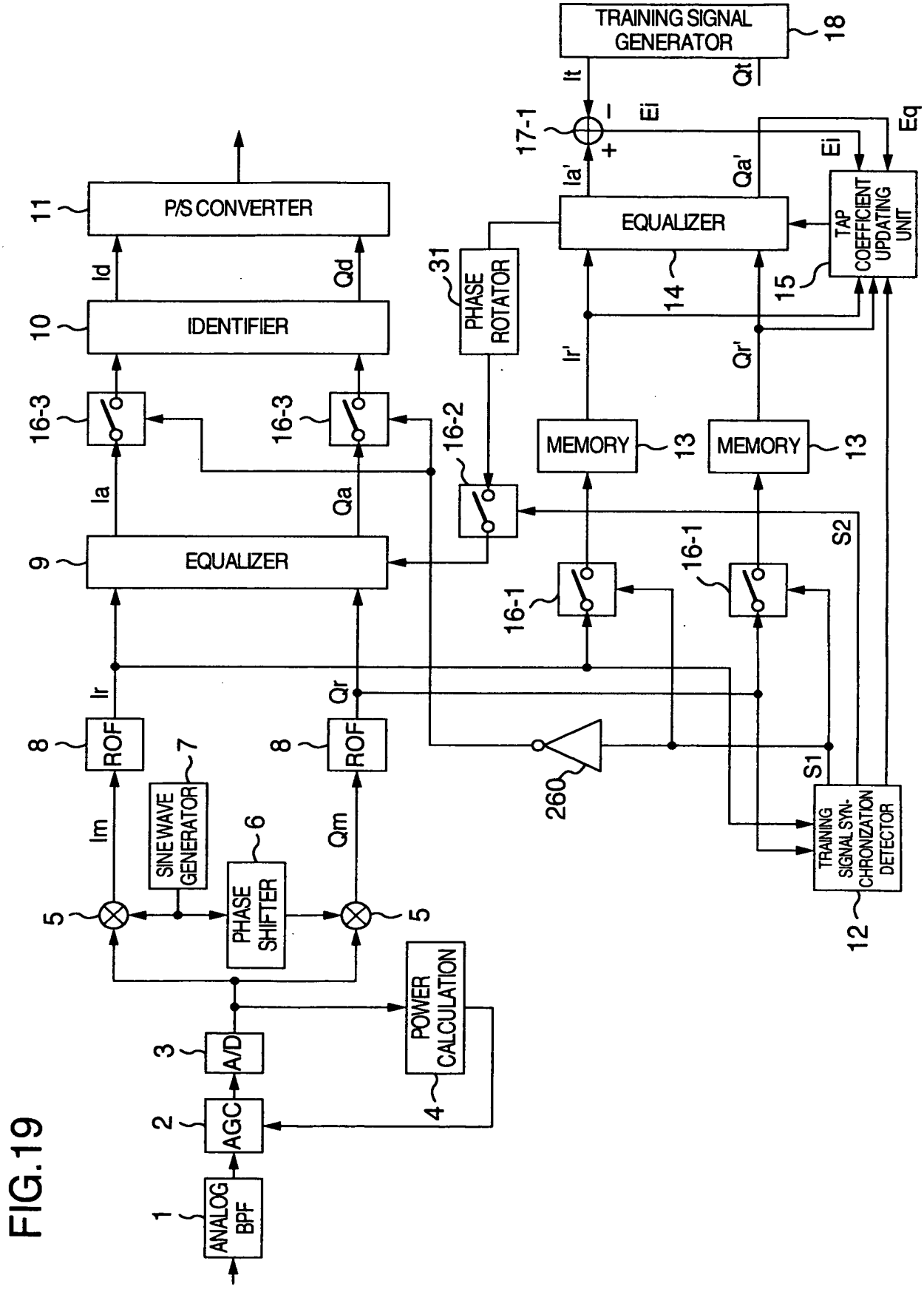

TRAINING SIGNAL GENERATOR
18
It
Qt
17-1
Ei
Eq
Ia'
Qa'
EQUALIZER
TAP COEFFICIENT UPDATING UNIT
14
15
31
PHASE ROTATOR
Ir'
Qr'
MEMORY
13
16-2
16-1
S2
S1
260
TRAINING SIGNAL SYN-CHRONIZATION DETECTOR
12
11
P/S CONVERTER
Id
Qd
10
IDENTIFIER
16-3
Ia
Qa
9
EQUALIZER
Ir
Qr
8
ROF
7
SINE WAVE GENERATOR
6
PHASE SHIFTER
Im
Qm
5
3
A/D
2
AGC
1
ANALOG BPF
4
POWER CALCULATION

FIG.19

FIG.20

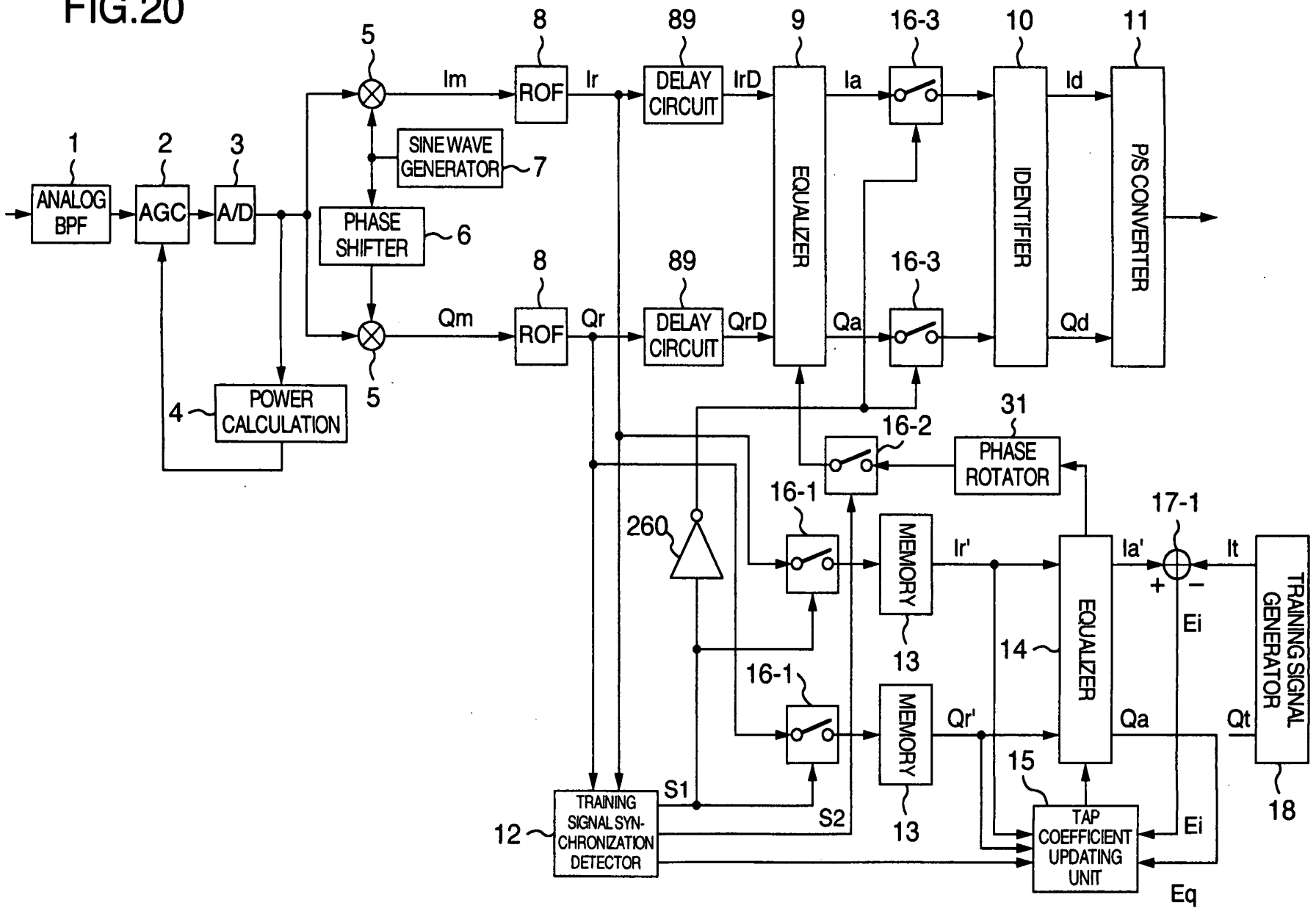
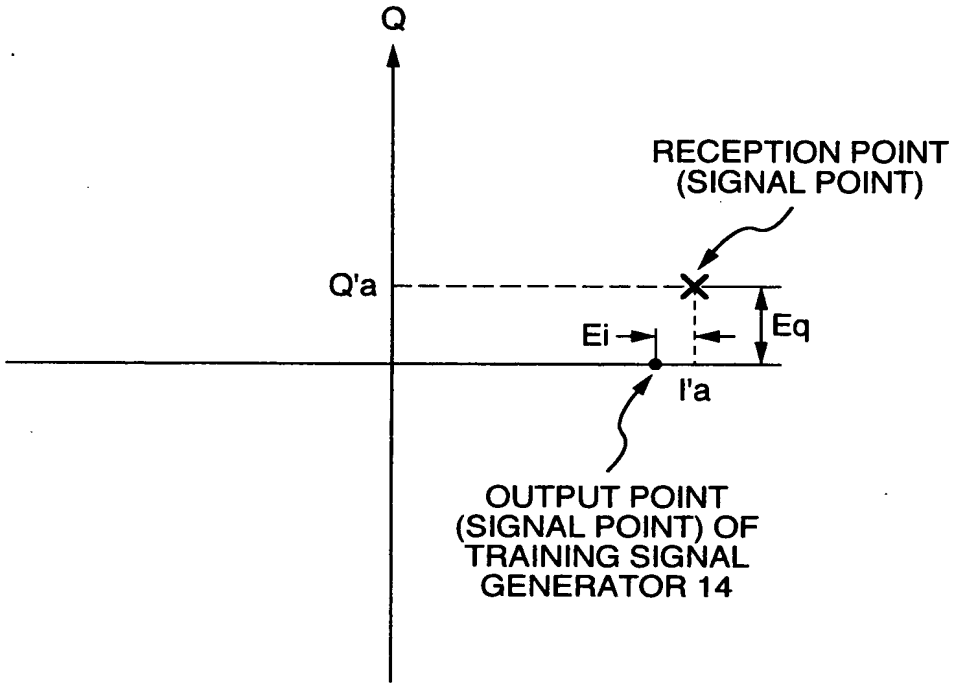

1
2
3
ANALOG BPF
AGC
A/D
4
POWER CALCULATION
5
5
PHASE SHIFTER
6
SINE WAVE GENERATOR
7
Im
Qm
8
8
ROF
ROF
Ir
Qr
89
89
DELAY CIRCUIT
DELAY CIRCUIT
IrD
QrD
9
EQUALIZER
Ia
Qa
16-3
16-3
10
IDENTIFIER
Id
Qd
11
P/S CONVERTER
31
PHASE ROTATOR
16-2
16-1
16-1
260
MEMORY
MEMORY
Ir'
Qr'
13
13
14
EQUALIZER
15
TAP COEFFICIENT UPDATING UNIT
Eq
Ei
Ei
17-1
+
−
Ia'
It
Qa
Qt
TRAINING SIGNAL GENERATOR
18
12
TRAINING SIGNAL SYN-CHRONIZATION DETECTOR
S1
S2

FIG.21


Q
RECEPTION POINT
(SIGNAL POINT)
Q'a
Ei
Eq
I'a
OUTPUT POINT
(SIGNAL POINT) OF
TRAINING SIGNAL
GENERATOR 14